

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 15 MAY 2006

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Applicant's or agent's file reference P019046WO MJH	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/GB2005/000037	International filing date (day/month/year) 07.01.2005	Priority date (day/month/year) 08.01.2004	
International Patent Classification (IPC) or national classification and IPC INV. H01L41/09			
Applicant THORLABS, INC. et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 26.10.2005		Date of completion of this report 12.05.2006	
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Steiner, M Telephone No. +49 89 2399-5784 	

**INTERNATIONAL PRELIMINARY REPORT
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International application No.
PCT/GB2005/000037

Box No. I Basis of the report

1. With regard to the **language**, this report is based on

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-24 as originally filed

Claims, Numbers

1-13 as originally filed

Drawings, Sheets

1/9-9/9 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-13
	No: Claims	
Inventive step (IS)	Yes: Claims	1-13
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V.

1 Reference is made to the following documents:

D1 = JP 01 043074 A

D2 = DE 19 33205 A1

2 INDEPENDENT CLAIM 1

2.1 Document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

A multi-axis piezoelectric positioner comprising a fixed part, a moveable part positionable in a plane relative to the fixed part, the moveable part comprising a piezoelectric device operable to expand and contract within the plane, and first, second, and third friction mechanisms fixed to the fixed part operable to selectively exert friction to the moveable part such that the movable part may be moved within the plane by selected activation of ones of the friction mechanisms as the piezoelectric device is expanded or contracted (abstract, figure 1).

2.2 The subject-matter of claim 1 differs from this known positioner in that instead of friction mechanisms, releasable clamp mechanisms are provided which selectively clamp the piezoelectric device rather than solely exert friction from one side.

2.3 The subject-matter of claim 1 is therefore novel (Article 33(2) PCT).

2.4 The problem to be solved by the present invention may be regarded as providing means for providing a higher holding force between the fixed part and the piezoelectric movable part with high accuracy.

2.5 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

D1 discloses a walker type piezoelectric positioner. Such devices are used for

example to move printheads over a sheet of paper, i.e. an application where clamping the fixed part (the paper) is not possible. The device disclosed in D2 is an actuator of the inchworm type, thus a device for a primarily linear actuation.

When seeking to improve the holding force of an actuator of the type disclosed in D1, the person skilled in the art would therefore not consider using a clamping mechanism as disclosed in D1, in particular because that would be contradictory to its original function.

Starting from D2, the technical problem could be considered to be the addition of an additional axis to the linear actuator. The person skilled in the art would, however, not necessarily contemplate an arrangement as claimed in the present application, since the established method for achieving this is the superposition of the movement of two such linear inchworm actuators.

- 2.6** The subject-matter of claim 1 of the present application is therefore inventive (Article 33(3) PCT).

3 DEPENDENT CLAIMS 2-13

Claims 2-13 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

- 4** Industrial applicability for piezoelectric positioners is given (Article 33(4) PCT).

Re Item VII

- 5** Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

Re Item VIII

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(SEPARATE SHEET)**

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- 6 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.